

2018-19 Influenza Season Summary

The number of influenza cases that occur each season is difficult to measure directly because many people who fall ill do not present for care and many who do seek care are not tested for influenza infection. The LAC Department of Public Health follows several indicators as a proxy for influenza activity, such as the percentage of emergency room clinical encounters that are for influenza-like illness and the percentage of tests for respiratory pathogens that are positive for influenza. We refer to the systematic collection and analysis of data on the indicators of influenza activity as influenza surveillance. This report summarizes the influenza surveillance data for LAC during the 2018-19 season. Data is presented by CDC MMWR surveillance week number. In 2018, surveillance week 1 ended on January 6, 2018. Week 1 of 2019 ended on January 5, 2019. Because influenza activity typically peaks in the winter months, the influenza surveillance period begins week 35 (typically ending the first Saturday in September) and ends week 34 of the next year.

Overview of 2018-19 Influenza Season

The 2018-19 surveillance season covers the period between August 26, 2018 and August 24, 2019. In LAC, influenza activity began to increase at the end of November and remained elevated through mid-April. Influenza activity peaked during surveillance week 9, ending March 2, 2019 (Table 1). DPH staff investigated 46 respiratory outbreaks, which occurred in skilled nursing facilities, schools and other community settings. A total of 125 influenza-associated deaths were reported to DPH.

The 2018-19 influenza season was notable in two ways. First, the season was characterized by the sustained predominance of influenza A viruses and very little circulating influenza B virus. Second, this season was unusually long. According to CDC, influenza activity was above the national baseline for 21 weeks, making it the longest influenza season in 10 years¹. CDC characterized the 2018-19 influenza season as being of moderate severity².

Final vaccine effectiveness estimates

are not yet available for the 2018-19 influenza season. According to data presented at the Advisory Committee on Immunization Practices meeting in June of 2019, the 2018-19 influenza vaccine was about 30% effective against all influenza illness and hospitalizations³. Effectiveness against H1N1 infections was 44% and against H1N1 hospitalizations was between 48% and 60%. Protection against H3N2 viruses was poor, likely due to the emergence of antigenically distinct H3N2 viruses near the end of the season. Vaccine strain components were updated in early 2019 to reflect the emergence of new H3N2 strains.

Table 1. Los Angeles County Influenza Surveillance Summary, 2018-19 Influenza Season			
	2018-19		2017-18
	Peak Week (9)*	Season Total**	Season Total
Sentinel laboratory data			
Positive Flu Tests/Total Tests	583/3,410	6,429/111,141	12,429/85,685
Percent Positive Flu Tests	17.1	7.7	14.5
Percent Flu A/B	99/1	98/2	66/34
Respiratory outbreaks			
Unknown Cause	2	21	113
Influenza	5	25	43
Total	7	46	156
Influenza-associated deaths‡			
Pediatric	0	2	2
Adult	11	123	287
Total	11	125	289

* February 24- March 2, 2019.
 ** MMWR surveillance week 35 through week 34 of the following year. For the 2018-19 season, this refers to the period starting 8/26/2018 and ending 8/24/19.
 ‡ Defined by a positive lab test, ILI symptoms, and clear progression from illness to death.

¹ <https://www.cdc.gov/flu/weekly/weeklyarchives2018-2019/Week39.htm>

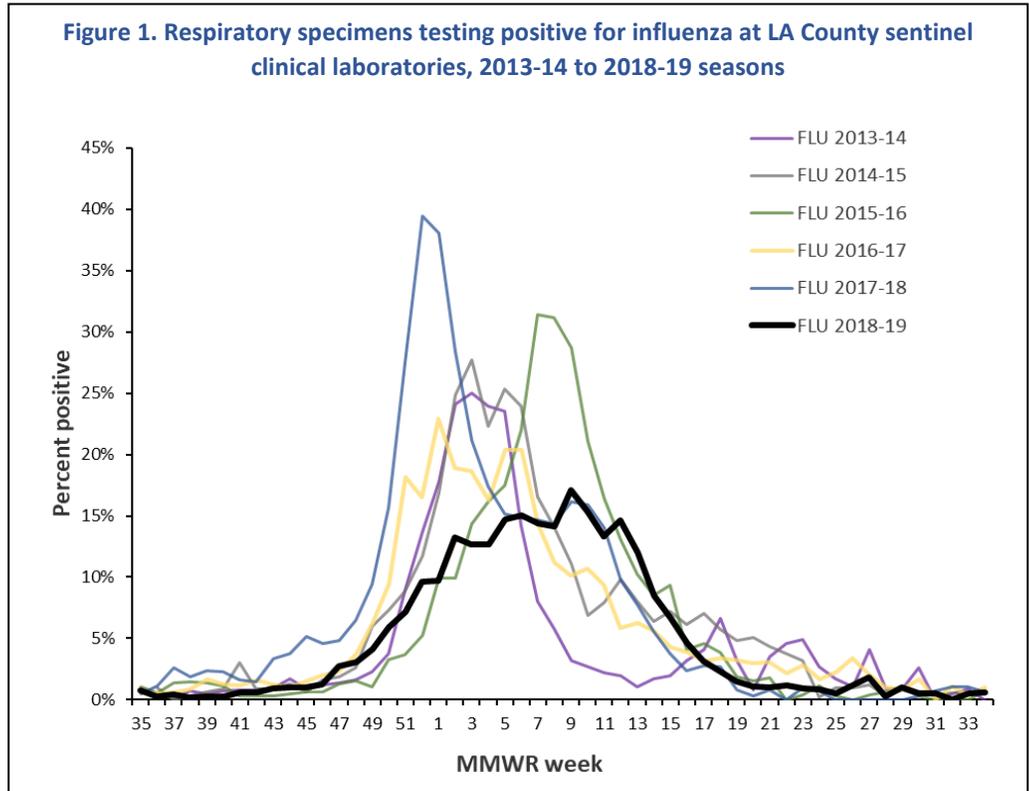
² <http://dx.doi.org/10.15585/mmwr.mm6824a3>

³ <https://www.cdc.gov/flu/vaccines-work/2018-2019.html>



Sentinel Laboratory Data

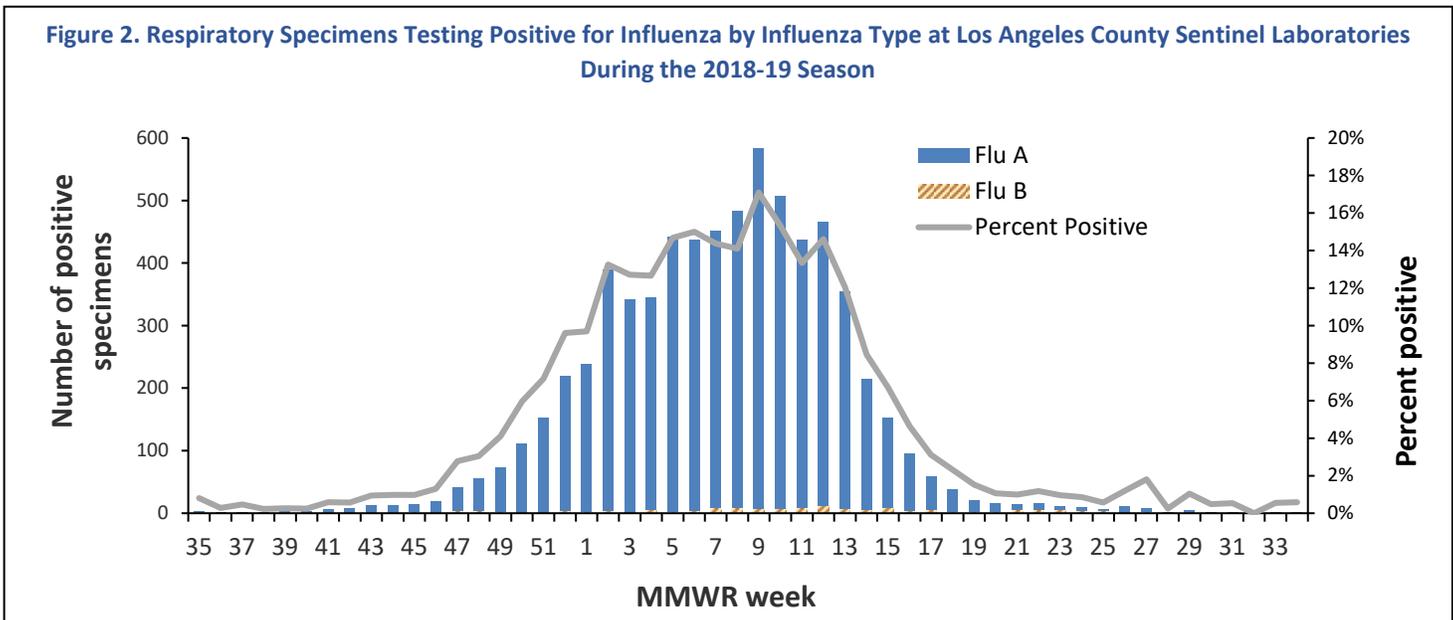
During the 2018-19 season, eight clinical laboratories serving healthcare providers and institutions across LAC reported to DPH weekly the total number tests conducted for respiratory pathogens and number that were positive for influenza. Between August 26th, 2018 and August 24th, 2019, a total of 111,141 respiratory specimens were tested for influenza (Table 1). Of these, 6,429 (7.7%) were positive. The percent of specimens that were positive for influenza was highest in week 9 (17.1%). This is a lower peak than seen in the previous five influenza seasons (Figure 1).



Influenza A predominated both locally and nationwide this

season. In LAC, 98% of all respiratory specimens tested at LAC sentinel lab were positive for influenza A (Figure 2). For comparison, only 66% were positive for influenza A during the 2017-18 season. According to CDC viral surveillance, this pattern was likely driven by an earlier wave of influenza A H1N1 followed by a later wave of influenza A H3N2⁴.

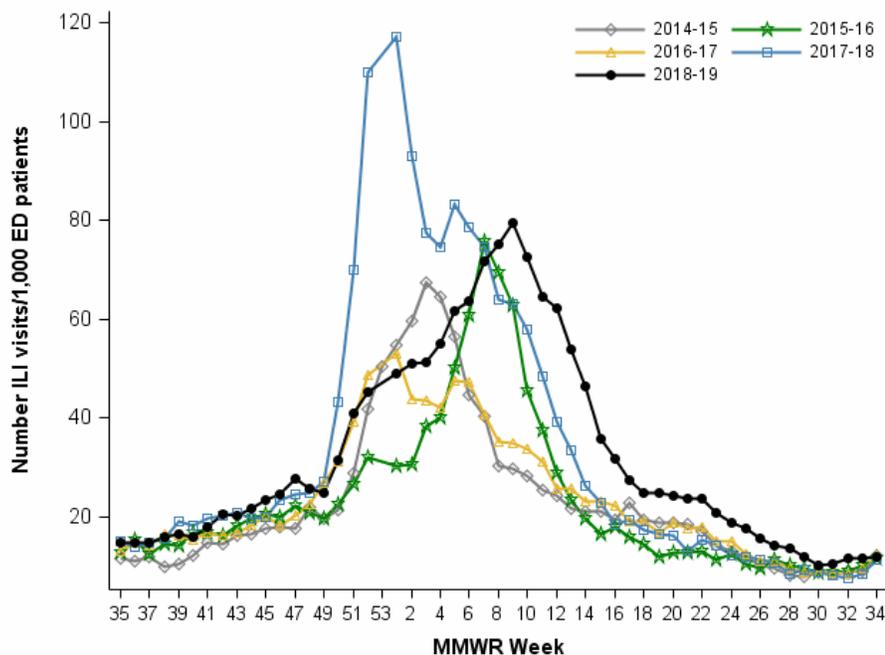
Figure 2. Respiratory Specimens Testing Positive for Influenza by Influenza Type at Los Angeles County Sentinel Laboratories During the 2018-19 Season



⁴ <https://www.cdc.gov/mmwr/volumes/68/wr/mm6824a3.htm>

Influenza-like Illness Emergency Department Visits

Figure 3. Influenza-like Illness Emergency Department Visits per 1,000 by MMWR Week, Los Angeles County, 2014-15 through 2018-19 Influenza Seasons

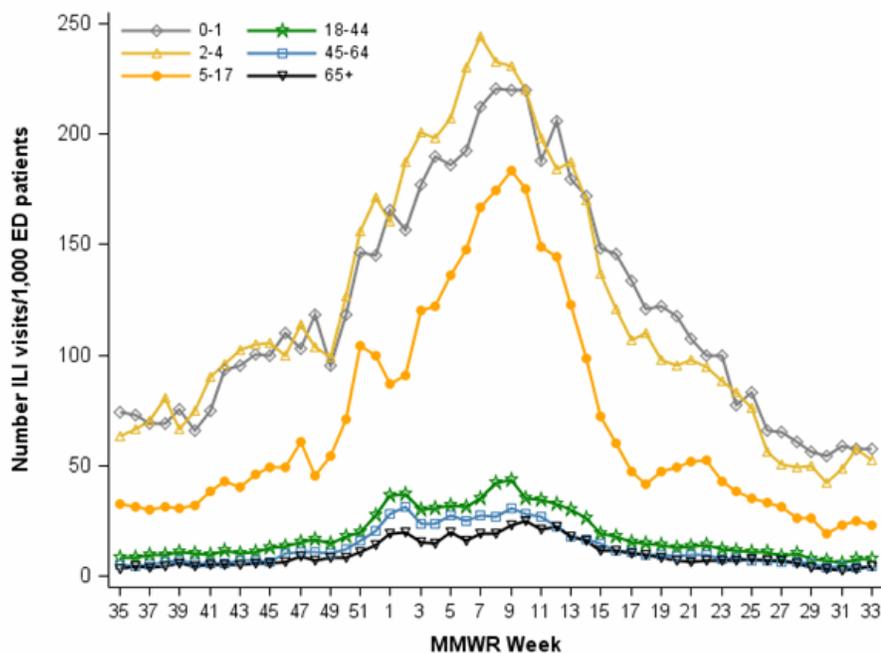


The LAC DPH Syndromic Surveillance Project monitors initial self-reported symptoms from patients presenting to participating emergency departments (ED) throughout LAC. These symptoms are categorized into different clinical syndromes according to specific key words.

The syndrome of influenza-like illness (ILI) includes symptoms such as fever, congestion, sneezing, sore throat, runny nose, and cough. This definition is slightly different from the definition of ILI used in other settings. Influenza-like illness may have causes other than influenza, including other respiratory viruses, bacterial infections, and non-infectious environmental factors. Although not specific to illness caused by influenza virus infection, monitoring the weekly proportion of ED visits due to influenza-like illness helps provide an indication of the burden of influenza infection on the healthcare system.

During the 2018-19 season, ED ILI visits peaked during week 9, with a rate of 79 per 100,000 visits (Figure 3). The peak ED visits for ILI rate during the 2018-19 season was the second highest observed over the past five seasons. Reflecting the long duration of this season, rates remained elevated from the beginning of December 2018 through the end of May 2019. ED ILI rates differed considerably between children and adults during this season, with the highest rates seen in children aged 2 to 4 years (Figure 4). This age difference may suggest that other factors in addition to influenza were driving ED ILI through the season.

Figure 4. Influenza-like Illness Emergency Department Visits per 1,000 by Age Category and MMWR Week, Los Angeles County, 2018-19 Influenza Season



Influenza-associated Deaths

Deaths associated with influenza infection are reportable in all ages in Los Angeles county. A death is confirmed as being influenza-associated when there is a laboratory confirmed influenza infection, the cause of death is clinically compatible with influenza or influenza complications, and there was no return to baseline health between infection and death. Clinically compatible complications can include pneumonia and cardiovascular problems like heart attacks. Influenza can also exacerbate long-term medical conditions (such as COPD, heart failure, or diabetes) which can lead to death.

During the 2018-19 influenza season, 125 confirmed influenza-associated deaths were reported to LAC DPH, two of which occurred in young children (Table 2). The median age was 68 years and most reported deaths were among those 65 years of age or older.

The number of influenza-associated deaths reported to LAC DPH does not represent the true mortality associated with influenza in Los Angeles County. Public health authorities recognize that current surveillance methods substantially undercount influenza-associated deaths. Most people who get influenza do not seek care. Most people who seek care are not tested for influenza. Severe complications of influenza may occur after the virus is no longer detectable in the body. Testing practices may vary across seasons. For these reasons, between season comparison of reported influenza-associated deaths may not be reliable.

Table 2. Demographic Characteristics of Influenza-associated Deaths, Los Angeles County, 2013-14 through 2018-19 Influenza Seasons

		18-19 N (%)	17-18 N (%)	16-17 N (%)	15-16 N (%)	14-15 N (%)	13-14 N (%)
Age (years)	Median	68	79	82.5	61	81	86.5
	Range	1-104	9-105	4-102	1-103	1-101	0-89
	0-5	2 (2)	0	1 (1)	2 (3)	1 (2)	1 (1)
	6-17	0 (0)	2 (1)	0 (0)	1 (1)	2 (3)	3 (3)
	18-40	8 (6)	10 (3)	2 (3)	10 (13)	5 (9)	14 (13)
	41-64	38 (30)	54 (19)	16 (20)	29 (38)	9 (16)	58 (55)
	65+	77 (62)	223 (77)	61 (76)	35 (45)	39 (70)	30 (28)
Gender	Male	72 (58)	132 (46)	35 (44)	41 (53)	29 (52)	68 (64)
	Female	53 (42)	157 (54)	45 (56)	36 (47)	27 (48)	38 (36)
Race	Hispanic	54 (43)	73 (25)	16 (20)	22 (28)	13 (23)	49 (46)
	White Non-Hispanic	39 (31)	123 (43)	39 (49)	24 (31)	29 (52)	39 (37)
	Asian/Pacific Islander	15 (12)	42 (14)	4 (5)	9 (12)	8 (14)	7 (7)
	Black	11 (9)	31 (11)	5 (6)	6 (8)	4 (7)	9 (8)
	Other	3 (2)	12 (4)	4 (5)	4 (5)	0	1 (1)
	Unknown	3 (2)	8 (3)	12 (15)	12 (16)	2 (4)	1 (1)
Total Fatalities		125	289	80	77	56	106

Acknowledgments

The Los Angeles County Department of Public Health Acute Communicable Disease Control Program would like to thank all of the laboratorians, infection preventionists, school personnel, Community Health Services staff, medical examiners, medical records personnel, nurses and physicians, and others who report cases, obtain information, control outbreaks, provide vaccine, and are an integral part in the surveillance and control of influenza, and other respiratory diseases, in Los Angeles County. Without these individuals, our work would not be possible.



Pneumonia and Influenza Deaths

The LAC DPH reviews all death certificates registered within LAC and records the number of deaths with pneumonia or influenza (P&I) listed as an underlying or contributing cause of death. The percentage of all deaths with a P&I cause serves as another indication of the severity of a given influenza season.

The 2018-19 season had a lower peak P&I proportion than previous seasons (Figure 5). At the peak of the 2018-19 season (week 9), 11% of all deaths in LAC had pneumonia or influenza included as a cause of death. Weeks 9 and 12 each had nine registered deaths with influenza listed as a cause of death, which was the greatest number reported during any week during the 2018-19 season (Figure 6).

Respiratory Outbreaks

Outbreaks of any disease are reportable in Los Angeles County. Respiratory outbreak definitions vary by setting; in general, the occurrence of a cluster of influenza-like illness (Fever > 100 F with cough and/or sore throat) is cause for investigation.

46 confirmed community respiratory outbreaks were reported to LAC DPH during the 2018-19 season (Table 3). This is the second lowest number of outbreaks reported of the last five years, which may be partially explained by changes in state and county level reporting definitions. Of the confirmed outbreaks, 25 were found to have a confirmed etiology of influenza, and for 21 outbreaks etiology was unknown. 19 outbreaks occurred in skilled nursing facilities, and 18 were in schools or pre-schools.

Figure 5. Pneumonia and Influenza Mortality as Percentage of All Deaths in Los Angeles County, 2016-17 through 2018-19 Influenza Seasons

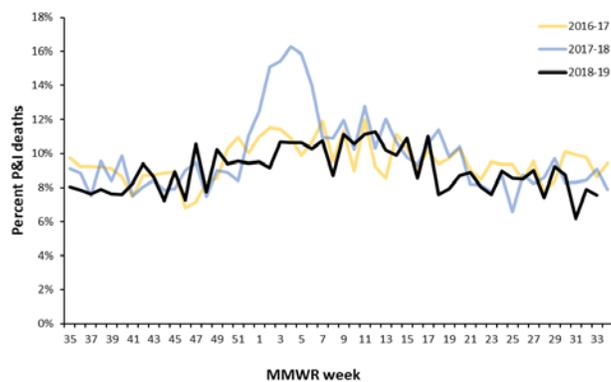


Figure 6. Pneumonia and Influenza Mortality by Cause and Percent of All Deaths in Los Angeles County, 2018-19 Influenza Season

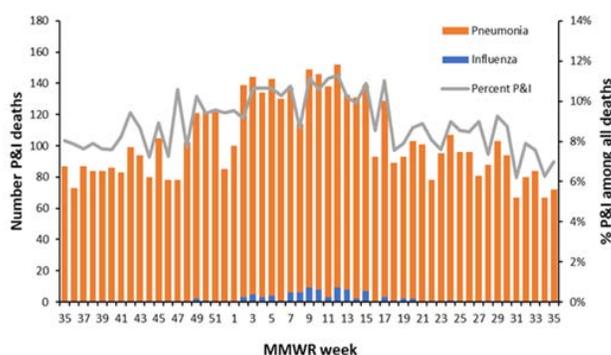
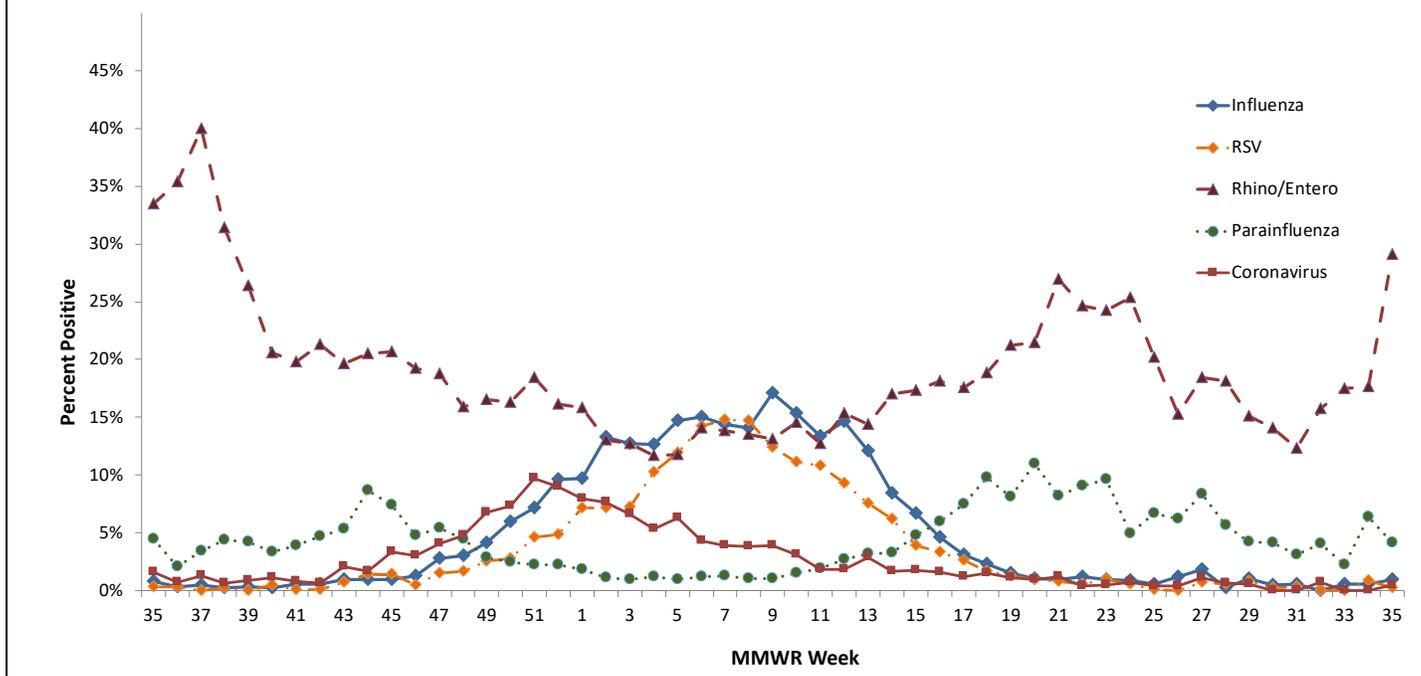


Table 3. Characteristics of Confirmed Community Respiratory Outbreaks, LAC 2013-2019

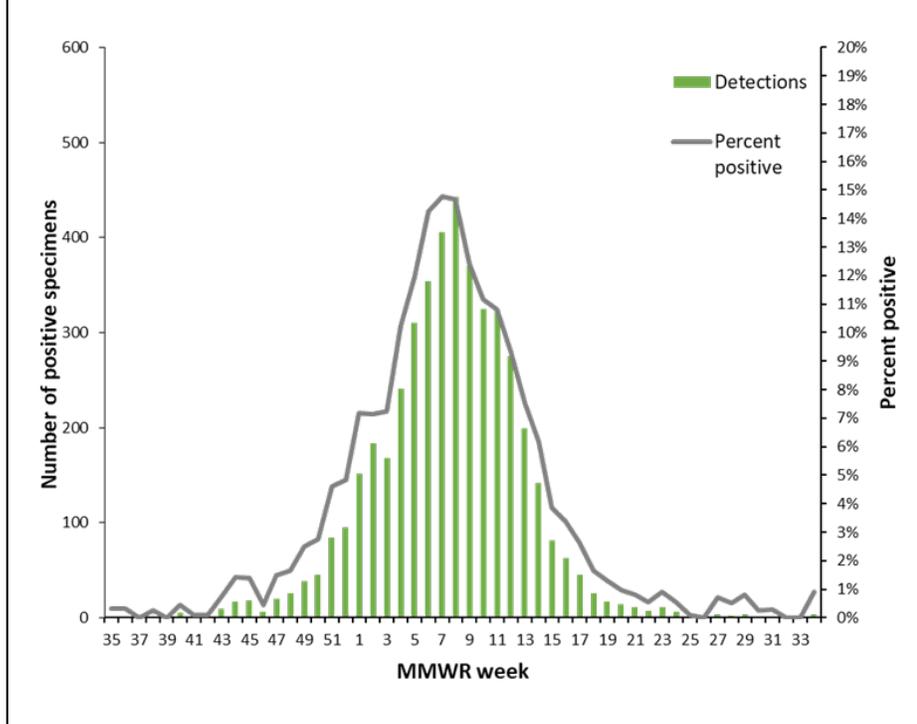
	18-19 N (%)	17-18 N (%)	16-17 N (%)	15-16 N (%)	14-15 N (%)	13-14 N (%)
Location						
Skilled Nursing Facility	19 (41)	81 (52)	33 (46)	15 (31)	32 (45)	14 (45)
School or Pre-School	18 (39)	34 (22)	23 (40)	23 (47)	24 (34)	11 (35)
Assisted Living	4 (9)	35 (22)	14 (19)	8 (16)	13 (18)	3 (10)
Daycare/child-care	1 (2)	4 (3)	2 (3)	1 (2)	2 (3)	2 (7)
Other	4 (9)	2 (1)	0	2 (4)	0	1 (3)
Etiology						
Influenza	25 (54)	113 (72)	37 (51)	22 (45)	42 (59)	5 (16)
Other Respiratory	0	1 (1)	8 (11)	2 (4)	0	0
Unknown etiology	21 (46)	42 (27)	27 (38)	25 (51)	29 (41)	26 (84)
Total	46	156	72	49	71	31

Figure 7. Respiratory specimens testing positive for respiratory viruses at LAC sentinel laboratories during the 2018-19 season



RSV and Other Respiratory Viruses

Figure 8. RSV Detections and Percent Positive by week, LAC, 2018-19 Season



Many of the laboratories that participate in LAC DPH sentinel surveillance for influenza also provide data for other respiratory viruses (Figure 7).

Like influenza, Respiratory Syncytial Virus (RSV) can cause severe illness and death – especially in young children. There is no vaccine against RSV, but infants at high risk of severe RSV complications can get a once a month medication called Palivizumab to prevent hospitalizations from RSV.

RSV detections peaked during week 8 of the 2018-19 surveillance season (Figure 8) and may have contributed to the high rate of ED-ILI visits among children. Deaths of children under five years of age due to RSV are reportable in LAC. One RSV death in a child under was reported to LAC during the 2018-19 season.

